

**WHAT IS CLAIMED IS:**

1. A two-step combustion system of an engine, wherein a fuel-air mixture is sucked into a combustion chamber by an operation of a suction valve driven by a cam for said suction valve mounted at an upper side of a cylinder head, and ignited by an  
5 ignition plug and burnt, the system comprising:

an auxiliary combustion chamber formed at an upper lateral surface of a main combustion chamber to be recessed toward a cylinder head;

a cam for an auxiliary combustion chamber valve formed at a cam shaft mounted at an upper side of said cylinder head and connected to a crankshaft of an  
10 engine via a belt to receive power for rotation;

a rocker arm for being contacted at a first bottom distal end surface of said rocker arm with a surface of the cam for an auxiliary combustion chamber valve and swung about a fixed axle to thereby transfer power by way of leverage operation; and

an auxiliary combustion chamber valve being contacted at a second bottom  
15 distal end surface of said rocker arm to vertically move and to open and close an inlet of said auxiliary combustion chamber.

2. The system as defined in claim 1, wherein said cam for said auxiliary combustion chamber is formed on the same cam shaft as that of said suction valve cam.

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3. The system as defined in claim 1, wherein the said cam for said auxiliary combustion chamber is shaped like an eccentric circle such that said auxiliary combustion chamber valve can be opened up to an end of compression and closed just before ignition and opened after the middle of an explosion stroke.